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Fibers of tension.—JACCARD²⁷ has investigated anew the already frequently studied differences in the structure and composition of the wood on the upper and lower sides of dorsiventral branches of dicotyledonous trees, along with the stimuli producing these differences. In the upper side of such branches he frequently finds what he has termed "wood of tension" and "fibers of tension," while in the lower side he finds "wood of compression" and "fibers of compression." The fibers of tension are produced by the tension stimulus acting upon the cambium region. This stimulus may result from the weight of the branch or from bending due to other causes, as negative geotropism or torsion. Hence the fibers may occasionally appear on the lower side of the branch or even on vertical branches. They can also be produced by the mechanical bending of upright stems. The duration and intensity of the stimuli are important as in tropisms. There is also a summation of stimuli as in tropisms. He speaks of the formation of tension fibers as a purely physiological response, which has no hereditary or phylogenetic significance.

The wood of tension differs from the wood of compression in the following ways: more compact grouping of wood fibers with a corresponding reduction of vessels; more considerable development of medullary rays with their reserves; more regular grouping of the wood fibers; longer fibers with smaller lumina. The microchemical study indicates that the fibers of tension are made up of a combination of hemicellulose, pectin, and lignin. Fibers of tension are more general in summer than in autumn wood. Of the indigenous trees of France, *Tilia* only lacked fibers of tension, and of the introduced forms *Liriodendron Tulipifera* lacked them. *Rhus typhina* lacked while *R. cotinus* bore them. They are generally absent in such shrubs as *Lonicera*, *Ribes*, *Ligustrum*, *Viburnum*, and *Corylus*.—WM. CROCKER.

Ecological anatomy of leaves.—The variations in transpiration and in structure exhibited by the leaves of various forest trees have been studied by HANSON,²⁸ using material from isolated trees growing in the open. Light, evaporating power of the air, temperature, humidity, and wind velocity were measured at the south periphery and at the center of the crown of the same tree, the transpiration of leaves from these two positions determined by the use of potometers, the dry and green weights of equal leaf areas obtained, and finally leaves from the two situations were compared as to structure as exhibited, in cross-sections. All the environmental factors showed wide differences, which may be illustrated by taking those obtaining within and without the branches of *Acer saccharum*, one of the 10 tree species studied. Here the conditions within the crown compared with those at its south periphery were for

²⁷ JACCARD, P., Bois de tension et bois de compression dans les branches doriventrales des feuilles. *Rev. Gen. Bot.* 19:225-242. 1917.

²⁸ HANSON, HERBERT C., Leaf structure as related to environment. *Amer. Jour. Bot.* 4:533-560. *figs. 21.* 1917.